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ABSTRACT

This booklet is one in a series that has been written for the general reader who wants to understand important trends in vocational education and training in Australia. Its focus is competency-based training and assessment. The booklet starts with the specific working environment of a blackjack dealer in a casino and explores the meaning of competency-based training and assessment in that context. In the second section, some general principles are extracted from that example. This leads to a discussion of one of the key issues--assessment in the workplace. The booklet then considers a particular approach to competency-based training and assessment and examines its benefits in a range of different occupations. Finally, some general ideas are developed about how to improve training and assessment by using the competency-based approach. An annotated list of 14 publications is provided for further reading. (YLB)

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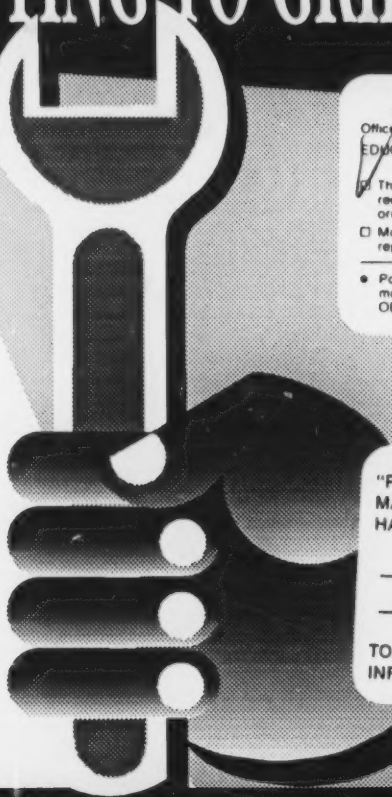

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ON-THE-JOB COMPETENCIES

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GETTING TO GRIPS WITH ON-THE-JOB COMPETENCIES

John Foyster

This booklet was funded by the Commonwealth Department of Employment, Education and Training.

ABOUT THE SERIES

The "Getting to grips with . . ." series has been written for the general reader who wants to understand important trends in vocational education and training.

Each booklet is in two parts. The first part comprises a description of the subject matter in a manner which is intended to be clear to any interested layperson. The second part gives an annotated list of publications for those who want to read further.

Other titles in the series include: *Getting to grips with skills audits*, *Getting to grips with competency-based training and assessment*, *Getting to grips with key technologies*, and *Getting to grips with on-the-job training*.

The Series Editor is Dr. William Hall, Executive Director, TAFE National Centre for Research and Development. The Series Designer is Bain Middleton. The photograph was provided by the Adelaide Casino.

ABOUT THIS BOOKLET

This booklet has been written by John Foyster. Terry Clark, Bill Hall and Peter Thomson provided useful criticism, while major advice was received from Chris Bishop, Con Costi, Steve Davis, Ralph Dutneall, Barry Henson, Susan Holmes, Paul Isaacs, Ian McKenzie, Carmelo Oliveri, Filomena Sousa, Robin Tomlinson and Charles Wressell.

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INTRODUCTION

If there is a popular image of what it means to be *in*competent, it is probably that of the person who is clumsy shuffling or dealing cards. The cards spill over the table, are dropped to the floor, or are dealt face up. Not one of us likes to be thought of as clumsy, and if we happen not to be dextrous, we probably try to avoid having to manipulate cards.

In getting to grips with the ideas of training and assessment as perceived by those advocating a competency-based approach, let's begin by considering the life of a worker who has to handle cards skilfully.

The intention of this booklet is, of course, to consider a more general situation, but choosing an example such as this will make some of the points more readily accessible. After describing something of the work done by a card dealer, we will go on to describe specific approaches to training and feedback that can help any worker - whether employee or employer - to feel and *be* competent. The booklet draws on lessons learned in several organizations that have directly focused their training efforts on the development of competence. It shows how these same methods can be applied to a range of working environments. It also shows how the competency-based approach may be implemented to bring with it desirable side-effects.

We therefore start with the specific working environment of a blackjack dealer in a casino and explore the meaning of competency-based training and assessment in that context.

In the second section of the booklet some general principles are extracted from that example. This leads to a discussion of one of the key issues: assessment in the workplace. Next we consider a particular approach to competency-based training and assessment and examine the benefits which are seen to follow in a range of different occupations. Finally we develop general ideas about how to improve training and assessment by using the competency-based approach.

The booklet focuses on training and assessment in the work environment - that is, 'on-the-job'. Although much of traditional training and assessment has occurred in TAFE colleges (i.e. 'off-the-job'), there is an increasing recognition that a mixture of off- and on-the-job training makes more sense.

The blackjack dealer

In a game of blackjack the dealer has a range of responsibilities. In the game the players each receive cards in turn from a dealer. A player wins if the total on the face of the player's cards is higher than the total on the face of the dealer's cards, but does not exceed 21.

Because blackjack is intended to be a game of chance, not a game of skill, all players should have an equal chance of winning. Obviously it is the dealer's responsibility to ensure that all players have a chance of winning, as well as following the house rules on how dealers should behave.

Therefore house rules and procedures are developed to protect the concept of blackjack as a game of chance. Thus, for example, if the game were played with a single deck of

cards the player who could remember which cards have been exposed would have an increased chance of winning as a result of that knowledge. To protect the nature of the game, the dealer works with a number of decks of cards, dealt from a 'shoe'. Even so, procedures are needed to exclude players from the game who develop card-counting techniques.

Other sets of rules are binding on the dealer, such as those referred to previously which establish the circumstances under which the dealer deals cards, and also those which determine how chips are managed.

Obviously the job of the blackjack dealer in a casino is more complicated than that of someone playing in a friendly card game.

As a result, although the blackjack dealer's job might be believed to be relatively simple ('anyone can deal a pack of cards') the practical reality is very different. The blackjack dealer has to follow a quite complex set of rules, with a high level of competence.

The blackjack dealer and 'competence'

Let's begin by analysing the job of the blackjack dealer somewhat more thoroughly. (In practice, as the reader will know, analysing a job takes a lot more time and effort than will be given in this brief introduction.)

There are three readily identifiable elements in the work of the blackjack dealer.

Skills

The blackjack dealer must possess a number of routine skills which are related to the game of blackjack. These skills are either generic (that is, they apply for all games of blackjack) or they may be local and specific (where a given casino may have particular house rules). In addition, the dealer must have certain routine skills related to the manipulation of gambling chips.

The blackjack dealer is also expected to possess a number of *non-routine* skills. From time-to-time the conditions of play will vary from what is expected (for example, one of the gamblers may become aggressive), and here the dealer may have to find a non-standard solution to the problem. In many such circumstances another member of the casino staff will take a leading role in solving the problem.

Standards

For each of these routine skills there is a required standard which is very high. Specifically, both players and casino management have expectations about *speed* and *accuracy* which result in only the very lowest error rate being acceptable. The conditions under which these routine skills must be performed are highly controlled, both physically and in terms of social and management requirements.

Conditions

The blackjack dealer works within a tightly defined environment, specified by employer and government regulation, but also defined by a particular social ambiance.

Within this delicately poised balance the blackjack dealer is expected to work with a range of patrons to the required standard.

Now let's generalise from this situation. How might we describe the blackjack dealer's working environment in terms of 'competence' and which can then be applied more generally?

Identifying a competence

As indicated above, various methods of carrying out vocational analysis are possible. These are not described here: they can be found in many reports and books.

Here we will deal only with the essential factors to be taken into account when describing a competence once the tasks relevant to the competence have been determined by the vocational analysis. There are three essential factors.

Skills There are skills that are required to perform the task. Some of these skills will be routine, and will probably be easy to recognize. Other skills will not be routine, and special care is needed to ensure that they are not overlooked.

Standards There are standards associated with the performance of the task and can be related to quality, to a rate of production, and to a low error or rejection rate.

Conditions There are the conditions under which the task is to be carried out. Work environment, time constraints, and similar factors need to be considered here.

Getting to grips with the language

Different users describe the competency-based approach in different terms. This is because different users have different needs. For example, the terminology has been in use for several years, but it is appropriate for describing a *system* of competency-based training. The National Training Board has developed a set of terms which makes it easier to manage this approach systematically, and you will probably find it useful to adopt this terminology.

In the NTB system, which is standards-focussed, the broadest way to describe competency is through *units of competency*, which can be readily identified as discrete entities. Normally a unit of competency is composed of a number of *elements of competency*, each of which has *performance criteria* attached to it. Because the person may have to demonstrate competency in a range of circumstances, it will also be necessary to describe the *range of variables*, that is, descriptions of the range of circumstances under which a person has to operate.

Let's now apply this language to the case of the blackjack dealer. The *units of competency* could be considered as card/game management in general, chip management, and people management.

The *elements of competency* for card/game management would include knowledge of game rules, knowledge of house rules, dexterity, etc.

The *performance criteria* for the physical dexterity element of card management would involve dealing so many packs of cards in a specific time, depending on the requirements of the casino.

The *range of variables* would include the full range of circumstances applying. Since the rules are tightly controlled, dealing with various kinds of customers would appear to be the main variable.

If we now have an understanding both of what competency is, and the competency expected of a blackjack dealer, we can turn to the question of how a blackjack dealer was and is trained to achieve competence, once again with a view to later generalization.

The training of a blackjack dealer

To achieve the routine skills which have been described for the dealer, training which is both extensive and intensive is possible. For the most part, the dealer practises to improve both card-handling and chip manipulation. In addition, the casino will have rules to ensure that the dealer handles non-routine problems (aggression, illness of a gambler) in a standardized way (which will therefore be equally fair to all gamblers), and these rules can be learned to a required standard which will imply a level of competence.

Basically these skills are obtained essentially by drill and practice. But other *non-routine skills* for which it is difficult to train to a given level of competence in this straightforward way also exist. These skills are non-routine in the sense that they cannot be codified as a set of rules (as in the game itself, for example), but they are *routine* in the sense that they are frequently required, not only in dealing a game of blackjack but also in many other positions, especially for organizations with relatively few employees.

These skills can be summed up as *customer relations*. The financial and social basis of a casino is, after all, that gamblers will enjoy themselves whether they win or lose money, and achieving this requires substantial interpersonal skills on the part of casino staff.

The blackjack dealer is therefore like many if not most employees: the dealer deals not only with cards but also with people. Gamblers expect a game of blackjack to proceed smoothly - perhaps almost mechanically - and yet all expect, either covertly or overtly, to be treated as individual human beings.

For example, the dealer has to manage simultaneously those who want the game to move faster and those who need the game to proceed slowly. Other similar potential conflicts have to be resolved smoothly.

In some positions interpersonal skills are required to so high a level that they swallow up the rest of the job. The blackjack dealer, however, has to get on with the job of dealing and satisfying all the players, while exercising appropriate interpersonal skills.

Having these skills is an essential part of the job, but training for it is rather different from training in card dealing and manipulating chips.

What training program will be suitable? A discussion of the training program follows, however these examples relating to the blackjack dealer are intended to have very general application.

The following description is based on information received from one casino.

Training a blackjack dealer

The training of a blackjack dealer occurs in the broader context of training for all employees and potential employees. We consider only the specific training needed by a person with no prior experience who wishes to become a dealer. Alternative pathways for those with prior learning also exist.

In the case of an inexperienced dealer, a basic course lasts for six weeks at twenty hours a week. (A person with some experience can take a short course of forty hours, while a trained dealer from another casino will require, after an interview and a table test, only a four to six hour course on local procedures.) At the end of that time the dealer will have served the mandatory training time, and will be required to have achieved the designated speed levels in dealing and chip-handling.

Testing for speed occurs at intervals throughout the training program. In addition spot checks of speed are undertaken for all working dealers. (A dealer who no longer meets these requirements is also required to take a refresher course.) Assessment at the end of the training program includes a theory component which will be tested with a short pen-and-paper test, but the emphasis is heavily on practical performance.

A second component of training is more general and is undertaken by all employees. Initial training is given to all employees, as well as ongoing appraisal on a regular basis (with intervals of either six or twelve months) of interpersonal and other related skills. In this area, as for other aspects of training and performance, support is available for employees not meeting standards.

Assessment of these interpersonal skills is carried out by a dealer's superior, but the same general procedure applies throughout the organization. Thus the person whose interpersonal skills are being appraised knows that the appraiser has been through the same process.

(Adelaide Casino)

Many organizations use such processes of performance appraisal as part of their normal evaluation of employees. In the casino environment, as elsewhere, such an appraisal is believed to be more likely to be successful if perceived to be part of the ethos of the organization, rather than a particular device for speeding up the production line.

Such an approach to assessing 'attitude' can succeed only if there is widespread acceptance of the ethos implied by the assessment procedure. Because the competency-based approach used in training and throughout the period of employment is widely accepted in physical performance areas, a method of 'attitude' assessment which is consistent with the other aspects of the job becomes more acceptable. In the case of the casino employee the importance of interpersonal skills is very obvious, making acceptance of such assessment strategies much more straightforward.

One quite important side benefit of a competency-based approach may be illustrated by this example. By acquiring the basic skills with a particular organization a person has obtained internationally-recognized qualifications and is able to move directly into employment after a very short familiarization program with a new employer. The benefit to both employer and employee is obvious.

There is also a more subtle benefit; the transportability of the competencies means that employees take with them experience which allows them to handle unfamiliar or *non-routine* (our definition) situations with ease.

Although readers of this document are unlikely to be employing blackjack dealers in the near future, the general applicability of this example is obvious.

In particular it highlights the training and employment benefits that can follow from such an approach, and it also demonstrates that wider recognition of identified competencies can, if well managed, produce a workforce which has skills which go beyond those prescribed.

Summing up the blackjack dealer

The example of the blackjack dealer has highlighted some difficulties. Assessment of the speed with which, for example, a dealer shuffles six packs of cards is an objective matter. But assessment of the interpersonal skills of a dealer is more difficult. The problem is solved in this case by having all employees subject to the same sorts of criteria that is fostering a particular corporate image to which they all subscribe. Such a solution will not necessarily be readily available to all.

Now let us consider all the available information on the training and assessment of blackjack dealers. First, we can see that:

- it is a relatively straightforward task to identify the competencies associated with a particular job;
- once the competencies have been identified it is possible to provide training which is modularized in terms of those competencies;
- assessment can be based upon standards specified in competency statements and the assessment can be based upon demonstration of skills;
- assessments can be recorded in terms of competence.

This discussion has also highlighted the importance of considering non-routine skills in understanding the job being done.

The example also demonstrates that while the specific skills related to dealing the blackjack cards must be addressed in training, other skills exist which are much more widely used and which must also be addressed continuously during employment. These interpersonal skills are quite difficult to develop and assess, but also very important in the successful performance of the job.

We now turn, in this section, to a more general consideration of training and assessment using the competency-based approach.

What is competence?

Since different readers of this booklet may have slightly different ideas about the nature of competence, we began by considering a specific example. It is now appropriate to describe concisely not only how 'competence' will be used here, but also to give a context for the definition.

The context for the discussion is clear: the training of workers at **all** levels. This broad context is necessary because it is generally accepted that we will all be better off if we feel, and are, competent about what we are doing. From that standpoint it is clearly important to enhance the competence of all, and where the focus of the training effort is the development of competence it makes sense to describe it as *competency-based training*.

There is not, of course, just one golden road to developing competence. The purpose of this section is to outline particular expectations one would have of such an approach.

Competence is the ability to perform a task to a standard as defined for the workplace. The word 'standard' is used here in the sense of the definition given in the National Training Board's publication *National competency standards policy and guidelines*.

A standard is:

> a statement in outcome terms of what is expected of an individual performing a particular occupational role.
> National Training Board 1991, p.32

(The word 'outcome' is used here to distinguish this approach clearly from those defined in 'input' terms such as 'hours of training' or 'type of training'. An outcome can be any identifiable demonstrated consequence of a training program: it may be a skill which has been acquired which in turn generates, for example, either a specific physical product or a particular kind of behaviour. The focus, in

other words, is on what the individual can do after the training program, not upon what goes into the training program.)

The notion of a standard and the idea of competence can then become most important in the development of the Australian workforce. The argument can be developed along the following lines.

We start from the proposition that any given occupation involves a number of tasks. It follows that a given occupation will involve a number of competencies.

If a worker in a particular occupation needs to possess a number of different competencies then it is likely that other workers in other similar work environments will have, amongst the competencies they need, some competencies in common with those required for our selected worker. Such competencies can be expressed in terms common across occupations.

Thus if achieving a competence implies reaching a standard, and also that the standard is applicable across a broader field, then the competence which is expressed in terms of the standard will have meaning in more than one occupation.

Such a concept is not merely theoretical. Here's a simple example recently given by Cassandra Parkinson:

> *Communication - both verbal and written - is emerging as a key skill in many industries.*
>
> Parkinson 1990, p.87

If common competencies, whether broad (such as communication skills) or narrow, (such as specific mathematical skills applicable to a small range of industries) are identified, then considerable benefit can be gained by the whole workforce. These benefits will only be realized if the shared competency requirements are recognized in the planning of training programs.

Identification of common competencies will only occur if competencies are carefully described. The factors which have to be taken into account in any such description have already been listed.

The next step is a consideration of the format and delivery of a training program based in competence.

WHAT IS COMPETENCY-BASED TRAINING?

There are, of course, many definitions of competency-based training. This booklet will make use of a definition developed recently for practical use.

In 1990 the TAFE National Centre for Research and Development prepared an inventory of competency-based training courses within TAFE. The definition used there relied on seven criteria which, with minor modifications in wording, are given below.

The seven criteria for competency-based programs

- A full list of the competencies has been documented with specified standards and conditions for each competency.
- Trainees can be assessed for their competency at any time they or their supervisors believe they are ready.
- Training is provided in a format which focuses on specific competencies.
- Assessment is based on the standards specified in competency statements.
- Assessment is for the most part based on actual *demonstration* of skills.
- Students/trainees can obtain exemption from part of the training (and move to the next unit of work) on the basis of demonstrating competence.
- Students/trainees' results are recorded in terms of a statement of competence.

Such a set of criteria can be applied to a training program to determine whether the training program is competency-based, whether it be off-the-job (as in the TAFE National Centre inventory) or on-the-job, as is being considered here.

How well do existing TAFE courses match these criteria? The answer is given succinctly by Michael Murphy.

> The TAFE National Centre has now completed its inventory and has found that only 13% of vocational courses meet the criteria of being competency-based, and that in only 57% of these was attainment of competencies required to obtain a pass.
>
> Murphy 1990, p.102

So how does the training for a blackjack dealer at a casino measure against the seven criteria?

It would appear that in the training program the second criterion (trainees can be assessed for their competency at any time they or their supervisors believe they are ready) and to some extent the sixth criterion (students/trainees can obtain exemption from part of the training and move to the next unit of work on the basis of demonstrating competence) are ***not*** met.

In this case, government regulations relating to the time required for training prevent the implementation of a program which meets *fully* all the criteria for being competency-based. The other five criteria are met completely.

The two unfulfilled criteria result from government regulations requiring fixed-length courses: although students are assessed for competency at intervals, reaching the required standard does not entitle the student to progress to a further level.

It could be argued however that the sixth criterion is met in part because an experienced dealer will be exempted from the basic training and will move straight into a short course focussing on particular local needs. Furthermore, the training specified for a blackjack dealer addresses directly some other issues raised in our adopted definition of competency. For example:

* A specific list of required skills is given.

* The standards required are specified in terms of routine skills, and also 'non-routine' skills.

* The conditions under which skills are to be performed are defined closely.

Thus we see that it is both easy and useful to apply these seven criteria for on-the-job training as well as for off-the-job TAFE college training, being readily applicable to whatever training program you are involved in. (A lesson to be learned from the TAFE inventory of 1990 is that others may not be as generous in their analysis of your training program as you are yourself.)

THE NATURE OF TRAINING AND ASSESSMENT IN THE COMPETENCY-BASED APPROACH ON-THE-JOB

Some benefits of on-the-job competency-based training have already been identified in passing in the discussion of the training of the blackjack dealer.

This section takes a more formal and sometimes academic approach in order to provide a theoretical context for those readers interested in this aspect of on-the-job competency-based training and assessment. It describes some of the problems which arise in implementing on-the-job training and assessment programs. It also offers a rationale for Australia's approach to training.

A consideration of the more general arguments about the competency-based approach in the workplace is a useful starting point.

At the recent conference on *Assessment and standards in vocational education and training* held by the TAFE National Centre for Research and Development, Dr Ute Laur-Ernst described the recent experience of vocational education and training in Germany (with the rider however that 'the 'German model' cannot be transferred to another society without modification, or without awareness of the cultural and political background').

Dr Laur-Ernst stressed the place of the workplace as 'the most efficient learning environment'. She also emphasised that in the description of work situations:

> General social, intellectual and emotional abilities must be included, because characteristics such as teamwork, communication, making independent decisions, planning and organizing work on one's own, are important aspects of efficient performance.
>
> The interests and goals of industry, commerce and trades cannot solely determine the framework whereby vocational standards and learning aims are defined. Those doing the work - their wishes, goals, experiences and competencies must not be ignored. Vocational training should also contribute to personal development. As a consequence, vocational standards should not be formulated without reference to cultural and social conditions and changes.
>
> Laur-Ernst 1990, p.22

With respect to assessment, Laur-Ernst pointed out that computerized multiple-choice questions are over-simplifications which are not sufficiently practice-oriented, that standard questions ignore the fact that the same competence can be acquired through a range of different kinds of work experience, and that these 'objective' questions may 'produce more injustice that an examination which takes the specific learning conditions and facilities into account'.

Finally, she said:

> The traditional concepts of training by demonstration and imitation by instruction and informing seem no longer to be accepted as the most effective strategies.
>
> Laur-Ernst 1990, p.29

Such comments lead towards consideration of the competency-based approach. It should not be assumed however that competency-based approaches are widespread

in the training community. Nor can it be assumed that the introduction of competency-based approaches will be an easy solution to all problems.

The following three pitfalls in implementing competency-based training programs were identified by Dr Bill Hall, Executive Director of the TAFE National Centre for Research and Development, at the same conference.

> There is a multiplicity of understandings about competence and competency-based training which will only be rationalized when there is an agreed definition of competence which is not idiosyncratic, is related to (at least) knowledge, understanding, skills, and performance, and includes evidence about such elements of competence as skills, standards, and conditions.
>
> The fallacy that 'measurement' in assessment is absolutely accurate must be avoided.
>
> There is a fallacious insistence that 'there is one, and only one, way to generate standards'.

The discussion which followed the delivery of Peter Kirby's paper at this conference indicated that TAFE staff see problems which must be dealt with.

Some problems for TAFE?

TAFE doesn't have sufficient resources to support industry needs for training and assessment. With the advent of the Training Guarantee, industry will necessarily become more responsible for training. There are, however, concerns relating to the quality of training and the training expertise available in industry, particularly within small business enterprises. Strategies to overcome these deficiencies could include:

- setting trainer/trainee standards;
- recognize, value, and reward training expertise as a key skill/competence/job classification in restructured awards and career paths;
- training levy guidelines for industry to develop a training infrastructure.

Concern was expressed that the current preoccupation with on-the-job training and the implementation of the Training Guarantee would result in a debasement of the 'educational' content of TAFE courses as well as those in the higher education sector; continuing and personal development education may be largely ignored.

Although TAFE is perceived as being largely industry-driven, TAFE teachers may feel loss of ownership and therefore commitment unless training is a dual partnership. If industry alone sets standards and develops courses there could certainly be a loss of quality. Industry assessors need training in assessment techniques and practice.

Kirby 1990, p.72

This summary of discussions emphasizes from the perspective of the TAFE college the complex issues arising from the move towards competency and industry-based training.

Industry needs and requirements relating to training also emerged at this conference. In a paper recently given by

Bryan Jones, Manager, Training and Development at Email, he argued that:

What competency-based training could do

Perhaps the most difficult change for many training providers and the training system in general to make is that from a traditional time- served approach to a competency-based one.

Competency-based training will significantly improve skill development and productivity of employees by focussing on the learning outcomes achieved, rather than the input, such as qualifications, length of training undertaken, etc.

It will be easy, because of the difficulties encountered in implementing competency-based training, to focus on (or revert back to) inputs rather than concentrating on the more difficult, though more rewarding focus of outputs.

The modular approach to training will make competency training easier to apply and this will also go a long way towards a more flexible and responsive training system. Students will be able to structure training very much to suit their work patterns and life styles.

Competency-based training can be delivered in a variety of ways and methods including group teaching, on-the-job, and self-paced.

Again increased costs will be incurred if the traditional teacher-centred method of delivery is practised: self-paced training could conceivably shorten training time required once the change to facilities is made. This in itself will result in reduced costs and more effective utilization of equipment and buildings. Broad national standards will be essential to ensure portability of skills acquired, with moves towards competency-based training reflecting these national standards.

Jones 1990, p.247

We also need to see competency-based training and assessment, the subject of this booklet, in a broader context. Michael Murphy argues that:

Competency-based training in context

The achievement of... quality outcomes will require significant enhancement and reorientation of current vocational training arrangement and structures.

It will also involve the implementation of a number of specific innovations including: the modularisation of curriculum; greater flexibility in teaching and learning techniques and training pathways; greater utilization of appropriate technologies to ensure access to training; the integration of workplace and off-the-job training components where they exist; and a competency-based approach to the delivery, assessment and certification of training based on agreed national competence standards.

It is clearly unrealistic to expect the immediate imposition of elaborate training structures within industry.

It is important to recognize that differing types and levels of trainers will be required in the workplace. There will sometimes be a need for full-time trainers, but more often managers, supervisors and co-workers will fulfil the role. This diversity will require a range of strategies to train and resource the trainers.

CBT (Competency-based Training) focuses on behavioural objectives or outcomes, but it is not simply concerned with the manual capacity or motor skills of a person. It needs to encompass the full range of knowledge, skills and application that a person utilizes in the competent completion of a function. There is, therefore, a practical need to recognize the importance of knowledge, skills and application which may not be directly observable, but which is nonetheless crucial to the task or occupation an individual is engaged in.

Murphy 1990, p.103-111

Everything in the garden is *not* rosy about competency-based training. In group discussions the following point is often made:

> Assessment and measurement of manual and physical tasks is easier than assessment of personal skills. This is a problem area which needs careful attention.
>
> Murphy 1990, p.119

This introduces the next section of our discussion. The problems of training vary greatly between occupations, although they do have some elements in common. The question of assessment and its difficulties raised here are, however, common across all occupations, and accordingly it is appropriate to focus for some time upon this difficult area, since assessing competency appropriately is a key to the successful implementation of a competency-based program.

Some current problems in assessment (especially in the workplace)

If competencies are clearly specified following the kinds of procedures described here, it seems that it would be relatively easy to assess competence. We must however be cautious, since assessment is itself a difficult area. We need to identify the barriers to successful assessment. The identification of the problems associated with successful assessment demonstrates these difficulties.

Problems in assessment can arise in two distinct ways. It is important to understand these problems, and also important not to confuse one kind of problem with another.

The first set of problems consists of all those which arise out of the inherent difficulty of the process of assessment itself.

Example: we know that errors occur when assessments are undertaken. Much of the methodology of assessment has been developed in order to minimize such errors.

The second set of problems is quite different and relates to what is being assessed and the agreement that exists, if any, about the appropriateness of its assessment.

Example: problems often arise in those areas of a job which relate to interpersonal relations, and might be summed up as 'attitude'.

These two distinct kinds of problems are discussed below.

What does recent research have to say about on-the-job assessment?

In their recent study *Testing times: a study of assessment on and off the job* Peter Thomson and Pat Pearce expressed some concern about the amount of assessment and training on-the-job.

> *In the case of a large metal industry employer, formal training and assessment were limited to the first year of the four year trainee (apprentice) program. Once beyond first year, the on-the-job training essentially became 'learning by doing' with individual supervisors having the responsibility for deciding what assessments, if any, should be*

made. For the most part, supervisors relied on the company's monthly assessment form. This form consisted mainly of a checklist of attitudes which was completed by the supervisors and to which was added a written statements from the trainee describing the tasks he or she had been working on during the period.

Thomson and Pearce 1990, p.12

Thomson and Pearce identified three problems in workplace assessment.

Three workplace assessment problems

1. With the exception of some larger organizations there is not enough formal assessment of performance on the job. (The fact that so many of the supervisors interviewed saw their tests as correctly focused is probably related to this limited amount of on-job testing. There was a tendency to see testing as something that was the responsibility of TAFE.)

2. Workplace supervisors have a limited appreciation of the difficulties and pitfalls inherent in the assessment of attitudes.

3. The assessment of attitudes that occurs in the workplace has more of a monitoring than an assessment function.

This view was reinforced by the responses of supervisors to Question 17 of the study's interview schedule, which asked for opinions about attitude testing. Thomson and Pearce report that:

Supervisors felt they could predict success on the basis of a trainee's attitudes at the beginning of the course. And although there might have been attempts by

supervisors to inculcate attitudes informally during training, we found no evidence of formal on-the-job attitude training. The role of attitude assessment in the workplace seems to be directed towards checking that 'good' attitudes are maintained.

Thomson and Pearce 1990, p.35

Thomson and Pearce make three recommendations for action which would address the identified problems:

- *raise the assessment skills of both teachers and supervisors;*
- *specify a greater role for industry in assessing on the job; and*
- *increase the quality of the assessment procedures.*

Expanding on the second and third recommendations above, Thomson and Pearce make the following suggestions.

More and better assessment

The present situation in which a large number of industries have abdicated all responsibility to off-the-job providers must be changed. Many important competencies cannot be properly assessed off the job. Consequently there is no way of knowing if these have been delivered by the training program.

Giving industry a greater role in the assessment process will have the added benefit of ensuring the relevance of the procedures.

More on-the-job assessment does not necessarily mean a reduction in assessment off-the-job, although this would hopefully be the case.

However, rather than considering the quantity of assessment it would be more profitable to focus on quality, because there is ample evidence that this needs to be improved.

Better assessment tools are needed for teachers and supervisors. Even with training it is likely that many teachers and supervisors will find it difficult to develop quality tests by themselves.

Consideration needs to be given to the establishment of a service to TAFE and industry which can make available quality assessment instruments.

Instruments would include written tests together with practical, project and assignment work designed for either on- or off-the-job assessment, as appropriate. Many of these could be made available in the form of item banks, some of which would be accessible by computer.

Thomson and Pearce 1990, p.37-38

Note that Thomson and Pearce stress the importance of on-the-job assessment. This explains the authors' first recommendation: they recommend raising the assessment skills of both teachers and supervisors.

They argue that 'both teachers and supervisors would benefit from more training in assessment techniques'. With respect to on-the-job assessment they comment that, 'as a rule, little was written down, the criteria for success residing in the head of the supervisor'. It can be strongly argued that such an approach is contrary to the basic principles of competency-based training; they also noted that weaknesses in this area of industry were freely acknowledged.

I argued in *Getting to grips with competency-based training and assessment* that assessment is a difficult task which must be undertaken in a way which ensures that the assessments are valid (that is, an assessment claiming to be

related to a particular competence is in fact an assessment of that competence) and reliable (that is, another person making the assessment would reach the same conclusion). While maintaining validity and reliability in assessment is essential, producing assessments to these specifications is quite difficult, and it is very tempting to ignore or minimize the problem and hope it will go away.

It won't, however, for 'competence' is a two-edged sword. Employee competence in performance can only be asserted confidently if the assessment of that performance is itself 'competent', and as in all things, competence in conducting assessment requires training - and the truth is that most people simply haven't had that training. The old-fashioned reliance on hierarchical authority is not adequate.

Faults in assessment are usually quite easy to identify (Thomson and Pearce provide some examples), and it is hardly consistent to establish a competency-based approach for workers but not for their assessors! It should be recognized that there are severe consequences of faulty assessment procedure for both assessor and employee.

Thus, argue Thomson and Pearce, those who make assessments must have appropriate skills. Furthermore, their investigation suggested to them that present skill levels in assessors are inadequate, implying the need for further training.

This leads us to a consideration of the two sets of problems identified at the beginning of this section: the inherent difficulty of making assessments and the question of what should be assessed.

The first group of problems - all linked to the fact that assessment is actually difficult to do properly - is compounded by the actions of those who do not recognize the difficulties. Additional training, as advocated by Thomson and Pearce, could reduce the seriousness of this problem. Training for on-the-job supervisors however may not be easy to organize. Alternatives which simplify the assessment task for supervisors (such as the item banks suggested by Thomson and Pearce) are practical developments which would rapidly improve the standard of assessment.

The second group of problems arises when differences of opinion exist about what should be assessed and how it should be assessed. In the case of competency-based training which has been developed in a specified way (for example, after suitable consultation with appropriate groups - unions, industry associations, individual employers, training committees), disagreements in interpretation can be minimized. This does not mean that no difficulties will remain. But these problems cannot be resolved here, and we turn now to examples of application of some of these ideas.

TRAINING IN PRACTICE

Specific aspects of training as they relate to the key elements of the competency-based approach are now to be considered.

The competency-based approach requires the careful documentation of *agreed* skills, standards and conditions with respect to the identified competences. The trainer/supervisor then uses these as a base to construct an efficient training program.

Many large organizations will have several full-time trainers, while some will have part-time trainers. Many organizations will be restricted in their training support to provision by staff members who find some time to conduct training/supervision. Yet all organizations want and will benefit from a highly-trained workforce. Although TAFE provides extensive off-the-job training and assessment, there will always be a need for appropriate on-the-job training in *all* organizations.

The competency-based approach allows the development of training systems which can enable the wider use of appropriate training and assessment. This flexibility exists because the approach is based upon the identification of specific skills to be developed and because the skills so identified are not in general limited to one organization.

Let us consider a brief example of the range of approaches possible - training in word processing.

Consider word processing systems which are used in a wide range of companies. The various packages - WordPerfect,

Microsoft Word, Wordstar and so on - are used in many different kinds of organizations, but training in their use will be, for the most part, the same in all of these organizations because the same competences are being developed to enable the same tasks to be performed.

What forms of training can be used? How can such training be delivered?

Ways of training

1. There are TAFE courses.
2. Courses are available from other providers (perhaps the software company itself, perhaps the supplier, perhaps a third-party trainer).
3. In some cases the word processing packages come with internal training systems (computer-based training).
4. Some organizations may run their own internal training programs, with or without outside support.
5. Video training and other 'high-tech' systems are available which can be used internally within an organization.

The above indicates that a wide range of options exists. Not all of these approaches however are available to all organizations.

Limitations on training methods

1. The first approach requires proximity to a TAFE college and availability of the course at an appropriate time. (A competency-based course, with flexible entry/exit, is more likely to be available when needed than courses using more rigid approaches to planning.)

2. The second approach depends on the existence of suitable other providers.

3. The third approach is available only for some packages, and usually does not include competency-based assessment.

4. The fourth approach will probably not be available to small organizations, for example.

5. The fifth approach will usually not include assessment.

Are there alternatives to these approaches? There certainly are.

The 'high-tech' possibilities

Tony Anderson of the NSW TAFE Commission has recently identified ten new methods of providing information to trainees/students:

10 new technologies

1. Satellite video conferences
2. Land-based video conferencing
3. Fibre optics information transmission
4. Digital video interactive and compact disk interactive
5. High definition TV
6. Multi-media (perhaps based on a personal computer)
7. Computer-managed learning and computer-based training
8. Pay television

9. Computer-based conferencing (via bulletin boards, etc)

10. Audio teleconferencing.

Each one of these technologies has the potential to *assist* in the delivery of training on-the-job. As we shall see in our later more-detailed consideration of just one of these (number 4) as an example, such technologies are unlikely to have the capacity to deliver training in all the competencies required in most companies, at least not to the standard required.

Lower technology assistance in on-the-job training is also available. If the problem for the company happens to be access to any available training (for example in a small company in a non-metropolitan location), then one alternative open to some organizations would be to seek assistance from another local organization, usually a larger one. A large organization may choose to reduce its training costs by offering to provide specific training for staff of other organizations on a fee-for-service basis.

Sharing approaches to training

Where competencies are clearly defined and generally accepted (as in the case of word processing, for example), a sharing approach to training has some clear benefits. In such cases the provider becomes an alternative when TAFE is unable to provide a suitable course. This approach may still have limitations with respect to timing and location - it may not be 'on-the-job' in the full sense - but does offer solutions for those organizations needing specific competency-based training.

Such strategies could work in a variety of ways.

For example, the Northern Territory Police and Emergency Services College has been able to make some of its programs available to community and business groups in such areas as rescue, security and evacuation procedures, and evidence gathering (for example, in retail security, forestry and wildlife, council inspections) on a fee for service basis.

A somewhat different initiative with potentially a wider application is the development of centres such as the Northern Adelaide Skills Training Centre. It is envisaged that the NASTC will have available both equipment and human resources to assist organizations which need specific training (i.e. defined by competencies) for their employees. In addition it is expected that the Centre will organise specific short-term programs at quite short notice. Such support can be provided either on the job (in the form of personnel with specific expertise, where this is appropriate, or alternatively in the form of specialised training equipment) or off the job where this is more appropriate. It is anticipated that the Centre will be fully purchased by 1992.

Central to the operation of the Northern Adelaide Skills Training Centre will be the clear definition of competencies required by those wishing to make use of the service offered. The manager, Con Costi, believes that before this kind of training support can be offered in a specific work situation, the employer and the employees will have to define their requirements precisely. This process will necessitate determining not only the anticipated outcomes of the training, but also the present skill-state of the employees for whom the training is being designed. An assessment of

existing skills (which will undoubtedly include a training component) would be conducted on-site, and would involve some new technology. An effective training program can only be developed if the employee's existing competencies are identified and recognized.

Such a co-operative approach is, of course, widely applicable in other areas where agreement exists on the skills required and the standards demanded. The potential inherent in such strategies is largely due to the nature of competency-based training.

WHAT SUCH TECHNOLOGIES CAN DO FOR YOU

It is worthwhile in this context to consider as an example the use of *one* of the new technologies as identified by Tony Anderson in solving the problem of provision of appropriate training and assessment.

The approach described below, although still developing, is increasing in popularity in those companies adopting competency-based training. Examples of use are given from four rather different companies to encourage recognition of the benefits of the competency-based approach. The four companies do of course make use of a range of training methods and approaches, and the identification of specific companies in the case study is not intended to imply that the companies are wholly dependent upon this particular approach nor that they endorse a particular supplier of a training technology.

An extended case study

Comparison between the four user companies allows us to identify possible solutions - and potential problems - in similar systems.

In this case study the use of one particular training methodology is described. The intention is simply to illustrate the wide applicability of a particular competency-based approach.

Background on interactive videodisc technology

TradeSkill is an interactive videodisc technology system marketed in Australia by Select Learning. Videodiscs are developed to cover training in specific competencies, and the equipment and software may be purchased or leased depending on needs.

In this approach the user works at a computer terminal, responding at various points in the video by selecting an answer to a question (usually posed as a problem to be solved). The user receives immediate feedback based on the answer given. One videodisc provides from two to four hours of training.

The TradeSkill system includes some additional features to facilitate the management of training. An administrative system which keeps track of the trainee's performance and provides a final report on the trainee's achieved level of competence is also provided. In addition, the system records all training undertaken, a useful feature when assessing requirements under the Training Guarantee legislation.

At the beginning of 1991 TradeSkill could provide over 190 videodiscs, providing up to 600 hours of training, in a range of industrial training areas (usually at apprentice level). Examples of topics covered are: *hand tools and measuring instruments, rigging and lifting*, as well as an eight-disc program on *applied industrial mathematics*, and a seven-disc program on *statistical process control*. There is a series of discs in the occupational health and safety area, another series in the management, supervisory and sales skills area, and another in computer skills training. The most recent

series includes a collection of process and instrumentation programs developed by the Instrument Society of America. It is anticipated that the library grow at a rate of about 50 programs a year.

The videodiscs are almost all American in origin, and very few have yet been produced in metricated versions, which will create some problems in those programs where measurement is an essential element. These problems do not appear to be insurmountable, however, and metrication is being progressively introduced. The first metricated package is entitled *statistical process control.* (This package also has now an 'English accent' voice track). Present users of existing TradeSkill discs will have the option to switch to the new metricated versions as they become available.

Access to the TradeSkill system is available in two ways, either through direct purchase of equipment or on a 'lending library' basis. The supplier, Select Learning, has already established two industrial training networks (at Wodonga TAFE and Karratha College in Western Australia) which are supported both by Select Learning and by IBM Australia. Companies may rent or lease learning stations and programs directly from these TAFE colleges. The colleges support the TradeSkill system by conducting follow-up training for user companies on a fee-for-service basis.

The cost of such a system obviously depends on the level of use, but is generally inexpensive compared to some alternatives. As a guide, early in 1991 rental of one learning station costs around $400-500 a month, with the rental of video discs running at under $150 per month for one disc or equivalent (which could be one disc kept for a whole month,

two discs each kept for a fortnight, four discs each kept for a week, and so on). In a single day a large number of different users can each work through a package, depending on the access which the company can provide.

Four case studies

The following are studies based on interviews with individuals who have provided basic information and also checked the details presented here.

Australian Newsprint Mills

Australian Newsprint Mills (Boyer Mill) first became involved in videodisc technology through its use of an industry-specific program related to pulp and paper processing. The success the company experienced in using this program encouraged further exploration of the videodisc technology.

At ANM the videodisc system is generally not used as a stand-alone system, but as an integral part of an overall training delivery system based on open learning principles. The interactive videos used include both packaged videodiscs such as those available from Select Learning and custom-made videos designed for ANM's specific needs. Due to cost factors, custom-made programs are currently produced on videotape rather than on videodisc since, despite improved technology, the speed of response for videotape is much less than interactive videodisc technology.

Major advantages of the interactive videodisc system include the integration of the learning system with its management

through a computer, in particular the capacity of the system to carry out appropriate assessment and monitoring of student learning.

The assessment/monitoring facility also makes it possible for a trainer to manage learning on an individual basis. Programs tailored to a company's specific needs are also being developed with this facility.

Some compromises however do have to be made in using packaged materials. A number of the programs offered by Select Learning match more or less exactly the competencies ANM is trying to develop while others have limited use because they do not meet ANM requirements. One of the major drawbacks relates to the use of the imperial system of measurement, which some Australian workers have little, if any, familiarity with. This deficiency is currently being addressed. Another disadvantage is that the trainee is unable to interact with the trainer or fellow participants in a program, although this can be overcome by arranging tutorials.

The system has some specific advantages in human terms. Some employees who are hesitant to become involved in a TAFE program because of feelings of inadequacy, for example, feel more comfortable using a videodisc system (although allowances must be made for the need to become familiar with the computer).

The flexibility of the system, in terms of the number of employees it can cope with, is also an advantage at times when companies are adjusting the sizes of their workforces. The most effective training systems are those which can

accommodate small groups, large groups, and individual trainees without *always* involving large amounts of trainer time. While further study of interactive videodisc technology is needed, the present advantages - in particular the relatively low cost of packaged programs - make this technology attractive for those looking for flexibility in their training programs.

Chris Bishop, Superintendent of Training and Development at Australian Newsprint Mills, Boyer Mill, has recently drawn attention to the need for training systems which 'are equipped to deal with the special need of mature age employees'. He comments that:

> *Mature age employees tend to have less time available for out-of-work study, it may have been many years since they were required to use maths and science skills, nor are they as conditioned to spending long periods of time studying as employees who may have recently completed technical college programs. There may be mental or emotional barriers that might need to be overcome, such as having to abandon their traditional position of seniority and learn new skills side-by-side with younger employees with fewer years of service.*

ANM believes that the challenge to deliver effective training can be met through systems such as TradeSkill.

Using TradeSkill we've been able to provide our mature age employees with appropriate training in a way which better meets their needs. We now offer our employees a range of courses which enable them to upgrade their skills at their own pace, in private, when it's convenient for them and their department. The results have been excellent. Our people have responded well to the introduction of interactive videodisc training. It has proven a valuable training tool and one that allows us to cater for the differences in what people need to know and how they learn.

Cadbury-Schweppes

Charles Wressell, a training manager at Cadbury-Schweppes, had been introduced to training packages using interactive videodisc technology at Australian Newsprint Mills.

At Cadbury-Schweppes a number of different programs have been used with varying audiences. For example, half a dozen of so staff, ranging from managers to clerical staff, have used the Lotus 1-2-3 videodiscs, while tradespeople have used the *centrifugal pump repair* and *digital electronic theory* programs. All laboratory staff were exposed to the *statistical process control* package.

The first intensive use was in November 1990, over a three-week trial period, and the success of this introductory activity (and the enthusiasm of those who took part) may lead to permanent adoption as a training aid.

There was initial apprehension amongst some of those involved in the introductory sessions but, as was the case at Australian Newsprint Mills, there proved to be considerable advantages in this system for those who would have been embarrassed to be in a 'class'.

Commented Charles Wressell:

> *They found they did not have to worry about messing things up because no one was looking over their shoulder, and that encouraged participation immensely.*

Although trade training continues to be conducted by TAFE in-house videodisc training has advantages because it can be assessed at any time in-house and doesn't require attendance at a TAFE college. As Charles Wressell is quoted in the Select Learning catalogue:

'We were amazed that people even came in on their own time to use the system.' This gives some idea of the interest and enthusiasm the system produces in users.

The quality of learning was also thought to be remarkably high. Workers in the introductory session were not chosen because they were already thought to be very able, and the outcomes for some workers, in terms of achieved levels, considerably outstripped the anticipated levels of competence.

The manuals which accompany the discs for Lotus 1-2-3 were thought to be particularly valuable.

One criticism which might be made of the interactive videodisc system is that the actual amount of learning - the number of competencies - involved in a particular disc is quite low, considering the price of the system. It could be argued that the same amount of information could be obtained from a $20 textbook. The difference is that people

will use the interactive videodisc system but won't read the $20 textbook.

BP Oil Kwinana

One major advantage of the interactive videodisc system - from the learners' point of view - is that it is a different way of learning. At BP Oil, where the videodiscs are used as part of an apprentice training scheme, one clear additional advantage is that apprentices are offered another perspective on the skills being learned. The videodiscs thus supplement the regular training program.

The fact that the videodiscs offer competency-based training makes it easier to integrate them into the training program: they can be scheduled to fit into the overall program at a specifically appropriate time.

In this particular company, the competency-based assessment system offers an additional advantage: BP Oil includes in its training program a number of apprentices from other companies, so it is a further example of the sharing approach discussed above. The automatic assessment and reporting system enables BP Oil to give direct feedback to the other companies on the progress of their own apprentices. It is hoped that in future it will be possible to provide these reports on floppy discs to simplify the reporting process even further.

At BP Oil the training environment has facilitated, where desirable, a different approach to learning using the videodiscs. A system has been developed whereby a projector has been used to make the video accessible to a

whole class. In this way interaction occurs within the whole group. This makes it possible for the learners to argue about strategies to be adopted, and encourages the development of communication skills.

Some other uses for the interactive videodisc system include:

- employees who fail to meet a required standard in an examination may use the IVT system, in privacy, for further training/learning;

- employees who need upskilling (say for promotion) can work in their own time or at scheduled work times.

Some key advantages of the system include:

- its being based upon adult learning principles makes it more appropriate for more workers;

- the existence of pre-tests makes it possible to determine accurately the needs of all workers;

- the speed of the system means that trainees receive feedback about their work quickly;

- because the videodisc programs are competency-based trainees are not held back by other trainees. Furthermore, trainees are not obliged to sit through lessons they have already mastered.

Town and Country WA Building Society

The use of the interactive videodisc system here is quite

different from those in the companies previously examined: here the focus is on management.

The initial motivation for its introduction was to move towards the provision of a consistent and fine-tuned management culture and increased excellence in performance.

The initial presentation made to the company by Select Learning was very impressive, with considerable follow-up. As a result it was considered worthwhile for this specific purpose.

From a user's point of view there were some significant advantages. Firstly, the novel and individual nature of the system encouraged participation. Secondly, although the system is computer-driven, those who are not computer-literate find it relatively easy to master because of its comparative simplicity.

On the other hand, Town and Country would prefer not to use the touch-screen system, which they thought presented some difficulties when not correctly calibrated. Nowadays a mouse-driven system, which is also user-friendly and has fewer technical problems, can be used more satisfactorily.

Town and Country intend to move beyond the management programs to the computer skills programs, with the Lotus 1-2-3 package being used by accounting staff, and other computing skills packages being used by the electronic data processing staff.

Two specific advantages of this system were singled out for comment.

First, as before, those who may feel uneasy in a classroom environment can work quite happily in the *privacy* provided by the interactive videodisc system. This system allows them to work quietly at their own pace without feeling the pressure of interacting with others.

Second, the fact that the system operates with individuals means that scheduling can be made quite flexible, with several different users operating the equipment during any given day.

The realism of the assessment process in some management videos was singled out for high praise by Robin Tomlinson of Town and Country.

> The interactive video for the personal interaction segment of our management course highlights in particular the need to approach different people in different ways to gain their cooperation. The 'real life' video demonstrated this need very clearly in an easily accepted series of interactions, and the senior staff that used the course felt that they had benefited from it.

Lessons learned from the case studies

An examination of the case studies makes the following points about the use of interactive videodisc in training.

- The training can be carefully managed.
- Learning can be accurately assessed.
- Learning can be managed on an individual basis.
- Learners feel more comfortable with targeted, individual learning systems.
- A 'high-tech' training system can have a glamour element to encourage the reluctant trainee/learner.
- Learning/training can occur at *any time*.
- Scheduling of learning can be based on company/individual needs.
- It is possible to integrate a 'high-tech' system with normal on-the-job training.
- This system may be used for remediation with little embarrassment for the employee.
- A system based on adult learning principles is better for adults.
- A competency-based computer system can very rapidly identify *exactly* those elements in which a trainee/employee needs specific training.
- Avoiding lockstep training means that trainees can get through a training program in less time.

What can be done?

The use of the competency-based approach to on-the-job training is not merely a theoretical idea which might be interesting to academics. It has been shown to have

practical meaning, as demonstrated in the study of the blackjack dealer and the more general studies of the use of videodisc technology. Competency-based training and assessment has been shown to be practical and to have many desirable outcomes.

Some of the benefits of using this approach have been mentioned by company users of one particular approach to competency-based training. In their views, this approach - or some aspects of it - makes for training:

* which can be targeted at the specific needs of a company while keeping costs down;

* which is clearly beneficial to employers in terms of meeting specific training needs and also keeping detailed records of progress achieved;

* which benefits learners by providing efficient and effective and *specific* learning which can be related to the job, and which also, by being individualized, protects the psychological needs of workers to learn at their own pace;

* which workers enjoy and which recognizes that adults need adult learning methods;

* which can be integrated with off-the-job TAFE training;

* which can be offered in both large and small companies.

This booklet has described only some applications of competency-based training and assessment. While there is a considerable amount of literature on the subject, much of the experience has not yet been documented; and that has been published in a wide range of publications. Relatively straightforward access to some of this literature for the interested reader is through a book which has been referred to several times, namely *Assessment and standards in vocational education and training*, which was published by the TAFE National Centre for Research and Development in late 1990.

Readers with direct experience of on-the-job competency-based training are invited to contact the author of this booklet should they wish to share experiences which may expand knowledge relating to the use of competency-based training.

FURTHER READING

Docking, R. (1990). *An A-Z of assessment myths and assessment in the workplace.*

This paper argues that appropriate and rigorous assessment methods can be developed and used in the workplace. Each page deals with a particular assessment *myth* and presents alternative approaches which (at least in theory) can be applied in the workplace.

Foyster, J. (1990). *Getting to grips with competency-based training and assessment*. TAFE National Centre for Research and Development, Adelaide.

This booklet is intended to introduce the general reader to the ideas associated with competency-based training and assessment. It defines competence and skills, applies these ideas to two sample programs, and then deals with testing for competency. A final section draws out the implications of this approach to training and assessment.

Hall, W.C. (1990). 'Summary and challenges', in proceedings of the conference *Assessment and standards in vocational education and training.* TAFE National Centre for Research and Development, Adelaide.

In this short paper the Executive Director of the TAFE National Centre for Research and Development summarises the contemporary Australian training context and describes the consequences for training.

Jones, B. (1990). 'What industry wants from the training system', in *Assessment and standards in vocational education and training*. TAFE National Centre for Research and Development, Adelaide.

In this paper the manager of training and development at Email provides an industry perspective on what are seen to be the training needs required to ensure that Australia becomes international competitive.

Kirby, P. (1990). 'Issues affecting assessment and accreditation' in proceedings of the conference *Assessment and standards in vocational education and training.* TAFE National Centre for Research and Development, Adelaide.

The then Chief Executive Officer of the South Australian Department of Employment and TAFE outlines his views on the impact on the TAFE system of changes in industry and training.

Levy, M. (1988). 'The role of core skills in work-based learning' in *Transition from education through employment.* October 1988, 17-19.

This brief article describes a project which uses an approach to occupational competence which is intended to promote adaptability and mobility within and between jobs and occupations. The focus for the core skills is on four different areas (communication, number, practical work and problem-solving). The core skills approach is intended to assist in the analysis of competence and the development of performance criteria. Some examples are given.

Laur-Ernst, U. (1990). 'The development of the vocational education system in the Federal Republic of Germany from the special perspective of the 1992 European integration' in the proceedings of the conference *Assessment and standards in vocational education and training.* TAFE National Centre for Research and Development, Adelaide.

In this conference paper Dr Laur-Ernst of the Federal Institute of Vocational Learning critically examines one country's evolving approach to vocational education. The key areas covered are: using formally recognised occupations as a reference system for vocational standards, ways of developing standards, problems in assessment and the consequences of implementing standards to develop training programs.

Murphy, M. (1990). 'Competency-based training: COSTAC working party report', in the proceedings of the conference *Assessment and standards in vocational education and training*. TAFE National Centre for Research and Development, Adelaide.

This paper provides a broad perspective on some of the issues addressed by reports of the Commonwealth/State Training Advisory Committee (COSTAC). Such major issues as the development of standards, the ways of delivering competency-based training, and approaches to assessment are dealt with from a national viewpoint.

Parkinson, C. (1990). 'Skill standards in the textile clothing footwear industries', in the proceedings of the conference *Assessment and standards in vocational education and training.* TAFE National Centre for Research and Development, Adelaide.

In this paper the Executive Director of the Australian Textile Clothing Footwear Industry Training Council describes how competency-based training is being introduced into the textile clothing footwear industry, focussing on the ways in which differences can be resolved as groups work towards the development of national standards.

TAFE National Centre for Research and Development, (1990). *Assessment and standards in vocational education and training.* Proceedings of a conference conducted by the TAFE National Centre for Research and Development, Adelaide.

This collection of papers from an international conference provides the simplest access to contemporary thinking about competency-based training in Australia in 1990. Several of the papers referred to above appeared in this book and many others explore fully the possibilities for approaching training in a competency-based way.

Thomson, P. & Pearce, P. (1990). *Testing times: a study of assessment on and off the job.* TAFE National Centre for Research and Development, Adelaide.

This report describes the outcome of a study of the assessment procedures which are in lace both on- and off-the-job. The study was based on consultations and

interviews with individuals in a range of industries in South Australia.

Thomson, P. et al. (1990). *Competency-based training in TAFE*. TAFE National Centre for Research and Development, Adelaide.

This report of a national survey of TAFE programs established a snapshot picture of TAFE training in Australia, focussing on the nature of the various competency-based programs early in 1990. The characteristics of these programs are described in tabular and diagrammatic form.

Thomson, P. (1991). 'Competency-based training: some development and assessment issues for policymakers.' TAFE National Centre for Research and Development, Adelaide.

This brief paper argues for the need to understand competence in context. It also deals with such assessment issues as the complex relationship between competence and performance and the need to recognise the problems to be faced in assessment of prior learning.

Wood, R. et al. (1989). *Boning, blanching and backtacking: assessing performance in the workplace*. The Training Agency, Sheffield.

This is a technical report of a study of work-based assessment in a variety of settings. The earlier sections (especially section 2) provide a context for thinking about assessment issues as they arise in the workplace, especially such matters as credibility, reliability and validity. The later

sections include 'real life' (and sometimes technical) examples of the application of these ideas.